Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
Establishing Just and Reasonable Rates for Local Exchange Carriers	)	WC Docket No. 07-135
	)	
High-Cost Universal Service Support	)	WC Docket No. 05-337
	)	
Developing an Unified Intercarrier Compensation Regime	)	CC Docket No. 01-92
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
Lifeline and Link-Up	)	WC Docket No. 03-109

To: The Commission

COMMENTS

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Robert A. Hart IV, P. E.
May 21, 2011

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I. GENERAL COMMENTS

1. These comments are being filed representing me, solely. I am a licensed professional engineer that has been designing communications networks for many years.
2. I have not had enough time to read all reply comments to the FCC NPRM. I have read the FCC's NPRM and the National Broadband Plan. I do not understand today many of the sections of these documents, and therefore, anticipate errors in this specific filing. The information in the FCC documents includes many important issues addressing USF, ICC, reasonable rates, lifeline, link-up America, etc., and potentially issues affecting Carrier of Last Resort obligations (COLR) for the "21st Broadband Century".
3. **I will need help and guidance from the FCC going forward if I am to continue to practice my profession (I am a licensed professional engineer in Louisiana-1974 and Tennessee-2002).**
4. My goal here is to express my concerns about new rules, if any, that may affect my ability to design communications systems for the future and my own continuing education in this regard. With my comments herein, I am only concerned about engineering infrastructures for facility based COLR's.
5. I would hope that, as a result of new rules associated with this NPRM, would address the questions that I will ask the FCC at the end of this document. Unlike others (that I will quote herein), I believe that the FCC has been valuable over the years associated with facilitating the deployment of radio, television, digital HD television, wire-based telecommunications, cellular, PCS, etc.
6. I have witnessed wireless licenses being awarded based upon comparative hearings, lotteries and auctions, just as one example of continuing change. Times and methods of operation change. I don't have enough knowledge to opine on award of spectrum licenses but overall as a customer and observer, provision of wireless services has been a wonderful success. I realize times are changing now with broadband communications the new focus.

7. **I need guidance from the FCC to continue to design communications systems-only for COLR facility based subsidized communications systems-if the COLR concept will even exist in the future.**
8. **If there are no obligations of a company but private sector survival, so be it.**
9. **I scanned several small telephone company filings)particularly from Alaska), that feel that this NPRM addresses company survival issues.**
10. I realize that the goals of the future are based upon broadband services delivery, and they will be variable packet-based, but sadly from my engineering perspective, there may be more to it than a mission statement, NPRM, broadband plan and a two month comment process. I believe the FCC a serious obligation to address future "high-cost" universal services support issues associated with communications infrastructure for the future, just and reasonable rates, intercarrier compensation and numerous associated serious issues going forward. There are costly infrastructures involved providing communications that my clients believed in the past, that these infrastructures were related to community, quality, intercompany and industry agreements and national security.
11. Communication is a two-way service that requires standards for systems to interoperate and to be of any value.
12. It is my opinion that, future considerations associated with design and implementation of Ethernet packet-based broadband IP infrastructure should include security but yet, relative to education, eCommerce, etc., enhance our country's ability to compete and win in a global economy. The future should be a "win-win" situation for all. Who is in a better position to "broker" the immediate needed guidelines and intercompany agreements, etc., over a transition period than the FCC?
13. I believe the cases for every type of "eService" imaginable over time have been well documented associated with, for example, "eCommerce", "eMedicine", "eEducation", etc. I am a "believer" and desire to do a good job going forward associated with the design of

broadband packet-based network systems including design and implementation of prudent subsidized infrastructure going forward. But to date I believe very serious issues are being ignored, gamed, or whatever, or I am just not reading enough and I may be totally wrong in my opinions and analysis.

14. Allow me just two examples please; in the AT&T filing I notice the term "**All IP Communications Infrastructure**" referred to frequently with absolutely no serious technical definition within their entire filing. No discussion of peer-to-peer interconnection, relative and/or guaranteed QoS intercompany broadband packet-based bearer or signaling interconnection; no discussion of backhaul infrastructure sharing (and pricing/division of revenue/settlements) in support of femtocells, etc. Even in the limit, a wireless based futuristic "self-organizing network architecture (backhaul)" even utilizing new spectrum (And I don't think new spectrum is a part of the current NPRM), would be of datagram architecture by definition subject to "black-outs" during unanticipated broadband traffic loaded conditions. Does anyone care about system stability in overloaded conditions anymore? I know AT&T has deployed an overlay hybrid fiber copper infrastructure utilizing a fiber to the node architecture. I personally enjoy AT&T's U-verse entertainment TV, video on demand and Internet services offering today. From a technical infrastructure standpoint, this is a multi-services delivery network and is a switched digital system including the datagram based Internet infrastructure (using totally distributed "system intelligence" as compared to selective routing, TCP and UDP/internet protocol-UDP being connectionless/datagram architecture). I believe this infrastructure has been designed to offer "best-efforts" QoS-Internet, better than best-efforts QoS (deterministic technical architecture with the ability to be engineered for busy moment usage-as compared to busy hour design techniques used in the past associated with Circuit-Switched (C-S) technologies-relative QoS by definition-using MPLS-TE and/or RSVP-TE selective routing), services admission control, and the ability to provide guaranteed end-to-end QoS via standardized

integrated services IP QoS techniques (but of course I truly don't know-in a competitive environment, planning secrets are of strategic value). I believe I have used relatively standard acronyms well known by FCC technical staff. I have studied this technical packet-based IP technical architecture for many years now and I know AT&T has serious knowledge of end-to-end quality of service issues, but do not find any of this addressed anywhere by anyone during this serious NPRM process. I may be wrong and this may be an insignificant issue. If planet Earth is facing serious global warming whereby hundreds of millions of people must be relocated during this century, one could easily overlook intercompany end-to-end QoS (and other facility sharing) issues.

Also in another filing I read the following and I quote; "**As discussed above, all-IP networks are fundamentally different from TDM networks from virtually every standpoint – market, technology, customer experience, regulatory treatment, etc. If left alone, market forces will drive sound economic choices about things like compensation and interconnection. And, if the Commission sought to anticipate that and drive a certain model or pick winners and losers in advance, it will get it wrong ["it" underlined here for clarity]**". I guess underlined "it" here is the FCC. This situation could be no further from the truth in my opinion and I am embarrassed to even address this statement. I can just hope and pray that the FCC has a higher regard for itself and the leadership it must provide, even if it takes a little more time for the process to be fully explored for the "All IP Broadband Network for the 21st Century". Please someone explain to me how market forces drove infrastructure choices associated with provision of electricity and telecommunications to the farms and rural high-cost areas during the 20th Century? These services were subsidized and CAPEX typically financed by the RUS (REA). Who is kidding who here and for what reason?

15. I believe I have made the educational technical leap in my personal continuing education to understand the intricacies associated with end-to-end quality of services in an all IP infrastructure environment

(variable packet length to 1,500 bytes), but interconnection of these infrastructures is not addressed and I would think this would be related to Intercarrier compensation in the future? This situation is being called the "dumb-pipe issue" in some industry media articles.

16. Please realize that most of the systems I have designed over past years were government financed systems for carriers of last resort (COLR). Since we knew we were designing systems to provide services to "high-cost" areas and that this was a subsidized proposition, we took special efforts in the design of these systems including the following:

    i. To be based on delivering COLR required customer services
    ii. Adhering to large urban company COLR "blue-book" standards (like the RBOCs)
    iii. Performing lowest total cost of ownership studies
    iv. Serious concerns about service provisioning for the system to remain stable during overloaded conditions (by temporarily not utilizing processor real-time for scanning for new service requests until prudent)
    v. Also, qualities of service/security concerns were always a top design issue.

17. As an engineer and looking into the past, I received profound assistance via published standards, methods of procedure and numerous additional guidelines over many years. Telecommunications was an industry. This included a mandate for all buried facilities (where feasible), conversion from human to electromechanical to digital software controlled digital switching, digital loop carrier, busy hour trunking and traffic designs with overload protection strategies associated with system stability during unexpected demand for usage (Gaussian situation beyond Z=+-2 units-the tangent situations). These system reliability techniques

included call admission control, alternate routing and a hierarchical interconnection design (class one to class 5 end office designs). The circuit-switched PSTN is still performing well. I realize that the future is broadband packet based Ethernet at the physical layer everywhere (both waveguide based and wireless). I am just hoping that serious quality/security issues (including interconnection quality/security issues) will be addressed by the FCC so I will know how to design systems for the future. Hopefully this will include FCC leadership associated with end-to-end system performance (when desired by a broadband customer if this remains a requirement for systems provided by COLR, only if COLR concepts remain significant).

18. Over past years the USA did not get to be a leader in planetary communications by an accident. High-level principles were utilized and jointly supported over the past years as follows:
    i. COLR concept
    ii. Guaranteed ROR on prudent investments for COLR
    iii. The need for CALEA and national security from many perspectives and technical levels; for example, the concept that a Telco would not allow anyone unauthorized access to the software controlling an end office switching system including building entry security.
    iv. The breakup of IntraLATA and interLATA Circuit-Switched (C-S) traffic including the concept of equal access to various IXCs-including end-to-end performance and deterministic system design principals and penalties for non-performance.
    v. Evolution from analog to digital transmission and end-to-end performance goals from via net loss models to serious end-to-end transmission loss in strict decibel requirements designed within a digital hierarchical trunking technical architecture, each trunk group with busy hour performance objectives that were taken seriously.

vi. Evolution of SS7 signaling, CLASS services, touchpad I/O, distinctive alerting, etc.-a huge list of evolution and improved services including mobility, portability with security concerns.

vii. My point here is just to address a few of the issues that were evidently addressed over past years of improvements that included improvements in engineering practices. What does the future hold? It's think it is more than a new division of revenue model and market driven technology choices? What if the market drives a choice of no broadband communications infrastructure to be provided? It is my belief that increased guidance going forward would be prudent and may prevent chaos.

II. A RELATIVELY PARALLEL COMMUNICATIONS OCCURRENCE

1. "The Internet" - I personally have a deep admiration for the commercialization of the Internet during the 1990's starting with "dial-up" Internet access. My business could not exist today without the broadband Internet-period, and new speeds and services will surely escalate probably beyond my imagination.
2. I can remember when I designed a cellular system during the late 1980's in the early days of cellular technology here in my home town of Baton Rouge. We estimated a tremendous growth to approximately 500 mobile customers for approximately an existing customer base of 50 IMTS customers. The design included three towers. There were soon 500,000 plus cellular customers. So we missed the forecast by a factor of 1,000 plus. Engineers are traditionally terrible about forecasting what customer's may desire; therefore the concept of a safety factor arises.
3. I have also witnessed professional debates about broadband communications system control associated with quality of customer service as compared to "kill it with bandwidth" models. My only concept here is my recent readings by a past president of Bell Laboratories and his opinion that the concept of "kill it with

bandwidth" solution is flawed over time in his opinion during that past time frame. I have not read anything recently that has convinced me that this is still not the case today. I may be wrong and if so, please describe in future rules and publications by the FCC, what is the new method to provide guaranteed end-to-end IP quality of service (QoS) if this is even a goal or an issue for the future all IP network.

4. For purposes of my reply comment (almost generic in nature), QoS used herein only will apply to broadband packet congestion within an interconnected variable packet based Ethernet network. I do realize that there are numerous metrics concerning IP QoS, but my only concern today is to me the most complex, which is congestion in an unexpected overloaded network condition with a remedy and if this is even a goal going forward that should be addressed. I feel an obligation to address this situation as an engineer at the end of the line associated with my country and national security. Also since many systems I design receive subsidized monies, I need objective high level guidance or I may error on the side of "perceived system gold plating". It currently seems to me like any new broadband network infrastructure should support full interworked integrated services (and to a lesser extent-differentiated services) IP QoS techniques.

III. QUESTIONS HOPEFULLY ADDRESSED BY FCC RULE

1. Will there be a designated COLR in the future? Will it be broadband specific or continue to be a telephone company that is currently offering satisfactory broadband services to its entire community?
2. Does it make any since to have two (or more if wireless is included) facility based COLR's in a rural "high-cost" areas receiving subsidies?
3. In an area where there is existing waveguide(s), will this affect COLR designation?
4. Will existing COLR designations be changed in any way? From a high-level analysis, will a COLR continue to receive a guaranteed ROR on prudent investments?

5. In an area that offers only "dial-up", will the facility based carrier be offered COLR status continuation if carrier commits to broadband evolution satisfactory to the FCC?
6. If an area has no facility based infrastructure, will fixed-wireless quality for COLR and associated subsidy monies (assuming this situation would exist only in a "high-cost" area)? If yes, how will this status be awarded? Also since fixed wireless may be easily intercepted for malicious purposes, will special IP security protocol rules be developed and mandated?
7. If the answer to one (1) above is yes, should the access infrastructure be designed with ability to support relative and guaranteed QoS? If the answer here is yes, will the FCC facilitate intercompany interconnection agreements associated with future relative and guaranteed QoS interworking arrangements? If an industry (like the telephone industry) cooperates and develops these arrangements including potential FCC review (and State PUC review), will this be satisfactory?
8. If the answer to one (1) above is yes, should facility based system design considerations include IP Multimedia Subsystem (IMS) and fixed mobile convergence and data offload as defined in recent 3GPP releases?
9. Will the FCC provide examples of "prudent" investments in facility based access infrastructure going forward without penalizing early technology adopters? Will "prudency related" facility based infrastructure recommendations be based upon subscriber density (including existing facility based infrastructure situations)? Or will the leaders of this country demand fiber all the way to the home?

I would extremely appreciate these issues being addressed by the FCC in the forthcoming published rule. With these nine or so issues address, I will be able to continue to appropriately design communications systems subject to being subsidized. As always, I also realize special cases may involve being addressed on an individual case basis. Thanks you.

Robert A. Hart IV, P. E.
May 21, 2011

CONCLUSION

1. Please consider these comments as new division of revenue methods, changes to USF/ICC, packet based interconnection and national infrastructure goals are formulated associated with broadband communications. Bold study and immediate leadership is definitely needed by the FCC. Please address the questions at the end of this document.
2. Based upon the comments that I have read, I can easily support comments made by OPATSCO, RBA, JSI, National Telephone Cooperative Association, Small Company Committee of LA, Texas Statewide Telephone Coop and all small independent telephone companies that are deploying broadband infrastructure as COLR.

Respectfully submitted,
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CERTIFICATE OF SERVICE

I, Robert Hart, certify that sufficient copies of the forgoing documents were mailed via FEDEX 5-23-2011 to:

Federal Communications Commission
ATTN: NPRM WC Docket No. 10-90, etc.

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I will try later today to use the electronic filing system.

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May 21, 2011